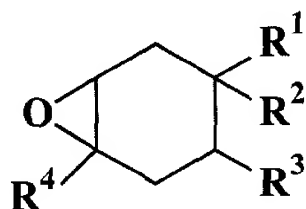


## CLAIM OR CLAIMS:

## WHAT IS CLAIMED IS:

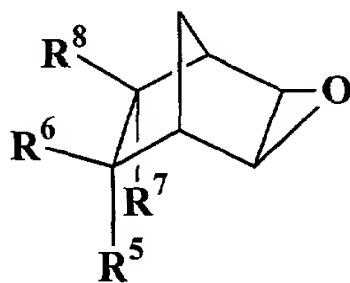
- 5                    1.        A functional fluid composition that generates reduced levels of carboxylic acid during use comprising:

- (a)        a basestock comprising a phosphate ester, and  
 (b)        at least one acid scavenger selected from  
             (i)        epoxides of the formula



(I)

- (ii) epoxides of the formula

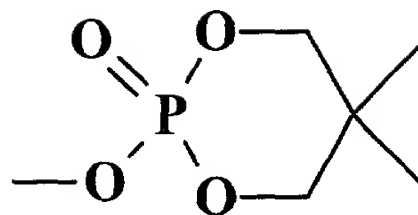


(II), or

- (iii) mixtures thereof;

wherein  $R^1$ ,  $R^2$  and  $R^3$  are independently selected from H,  $-(CH_2)_n-R$  and  $-C(O)-R^{12}$ , and wherein one or two of  $R^1$ ,  $R^2$  and  $R^3$  are  $-C(O)-R^{12}$  or  $-(CH_2)_n-R$ ;  $R^4$  is selected from H or

- 20  $-CH_3$ ; and  $R^5$ ,  $R^6$ ,  $R^7$  and  $R^8$  are independently selected from H,  $-(CH_2)_n-R$  and  $-C(O)-R^{12}$ , and wherein up to two of  $R^5$ ,  $R^6$ ,  $R^7$  and  $R^8$  are  $-C(O)-R^{12}$  or  $-(CH_2)_n-R$ ; wherein R is selected from H, a linear or branched alkyl group having 1 to 12 carbon atoms, an arylalkyl group having 7 to 12 carbon atoms,  $-O-R^{10}$ ,  $-O-R^9-O-R^{10}$ ,



, or  $-\text{Si}(\text{OR}^{11})_3$ ;  $\text{R}^{12}$  is selected from a linear or branched alkyl group having 1 to 12 carbon atoms, or an arylalkyl group having 7 to 12 carbon atoms,  $n$  is an integer from 1 to 4,  $\text{R}^9$  is an alkylene group having 2 to 6 carbon atoms,  $\text{R}^{10}$  is an alkyl group having 1 to 12 carbon atoms,  $\text{R}^{11}$  is an alkyl group having 1 to 8 carbon atoms, and  $\text{R}^{12}$  is an alkyl group having 1 to 12 carbon atoms.

2. The composition of claim 1 wherein said acid scavenger is an epoxide of formula (I).

10 3. The composition of claim 2 wherein one of  $\text{R}^1$ ,  $\text{R}^2$  and  $\text{R}^3$  is  $-\text{C}(\text{O})-\text{R}^{12}$  or  $-(\text{CH}_2)_n-\text{R}$ .

4. The composition of claim 3 wherein one of  $\text{R}^1$ ,  $\text{R}^2$  and  $\text{R}^3$  is  $-(\text{CH}_2)_n-\text{R}$ .

15 5. The composition of claim 4 wherein  $\text{R}$  is selected from a linear or branched alkyl group having 1 to 12 carbon atoms, an arylalkyl group having 7 to 12 carbon atoms,  $-\text{O}-\text{R}^{10}$ ,  $-\text{O}-\text{R}^9-\text{O}-\text{R}^{10}$ .

6. The composition of claim 5 wherein  $n$  is 1.

7. The composition of claim 2 wherein  $\text{R}^1$  and  $\text{R}^2$  are  $-\text{C}(\text{O})-\text{R}^{12}$  or  $-(\text{CH}_2)_n-\text{R}$ .

20 8. The composition of claim 7 wherein  $\text{R}^1$  and  $\text{R}^2$  is  $-(\text{CH}_2)_n-\text{R}$ .

9. The composition of claim 8 wherein  $\text{R}$  is selected from a linear or branched alkyl group having 1 to 12 carbon atoms, an arylalkyl group having 7 to 12 carbon atoms,  $-\text{O}-\text{R}^{10}$ ,  $-\text{O}-\text{R}^9-\text{O}-\text{R}^{10}$ .

25 10. The composition of claim 9 wherein  $n$  is 1.

11. The composition of claim 2 wherein  $\text{R}^1$  and  $\text{R}^3$  are  $-\text{C}(\text{O})-\text{R}^{12}$  or  $-(\text{CH}_2)_n-\text{R}$ .

12. The composition of claim 11 wherein  $\text{R}^1$  and  $\text{R}^3$  is  $-(\text{CH}_2)_n-\text{R}$ .

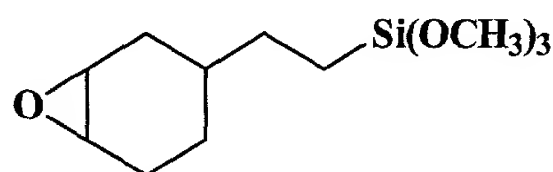
13. The composition of claim 12 wherein n is 1.
14. The composition of claim 2 wherein  $R^4$  is H.
15. The composition of claim 1 wherein said acid scavenger is an epoxide of formula (II).

5                    16. The composition of claim 15 wherein one of  $R^5$ ,  $R^6$ ,  $R^7$  and  $R^8$  is  $-C(O)-R^{12}$  or  $-(CH_2)_n-R$ .

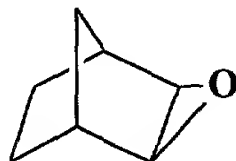
17. The composition of claim 16 wherein one of  $R^5$ ,  $R^6$ ,  $R^7$  and  $R^8$  is  $-(CH_2)_n-R$ .

18. The composition of claim 17 wherein n is 1.

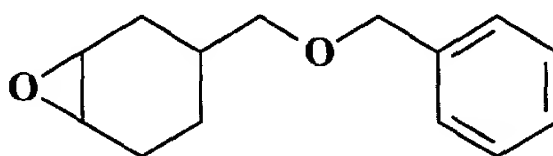
10                    19. The composition of claim 1 wherein said acid scavenger is



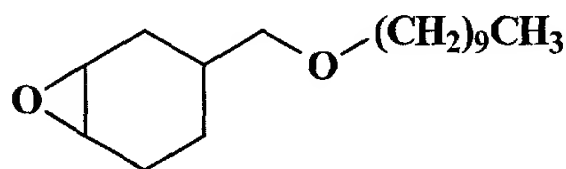
20. The composition of claim 15 wherein said acid scavenger is:



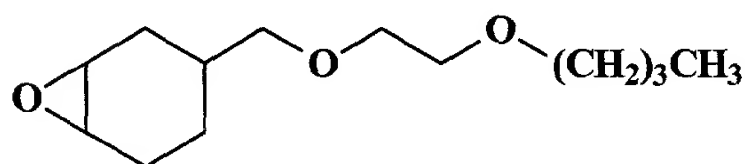
15                    21. The composition of claim 6 wherein said acid scavenger is



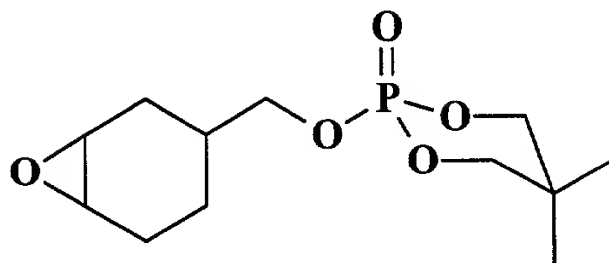
22. The composition of claim 6 wherein said acid scavenger is:



20                    23. The composition of claim 6 wherein said acid scavenger is:

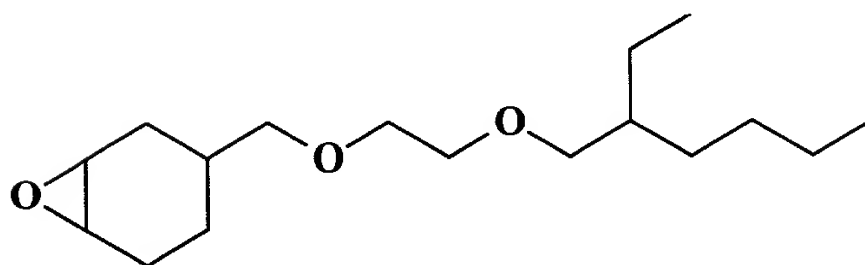


24. The composition of claim 1 wherein said acid scavenger is:

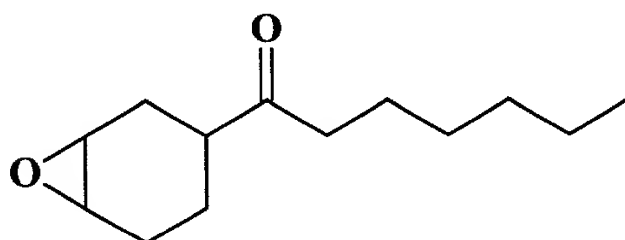


5

25. The composition of claim 6 wherein said acid scavenger is:

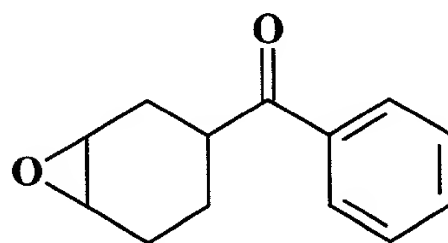


26. The composition of claim 3 wherein said acid scavenger is:

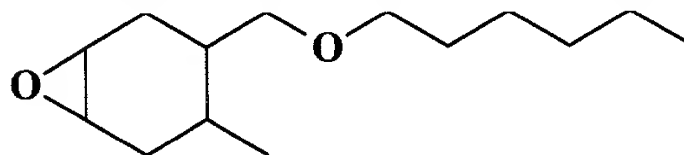


10

27. The composition of claim 3 wherein said acid scavenger is:

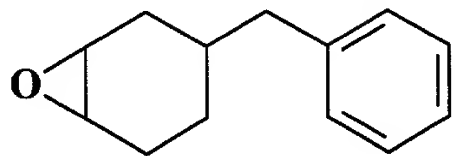


28. The composition of claim 13 wherein said acid scavenger is:

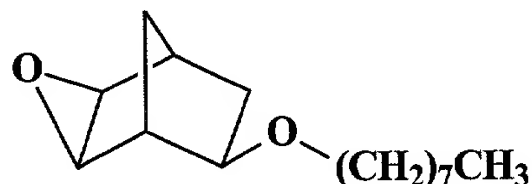


15

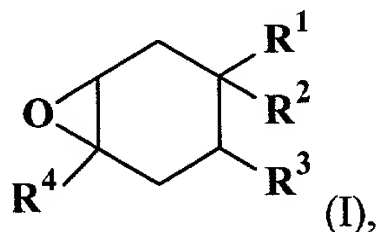
29. The composition of claim 6 wherein said acid scavenger is:



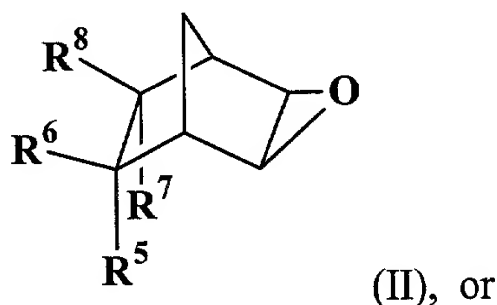
- 5 30. The composition of claim 18 wherein said acid scavenger is:



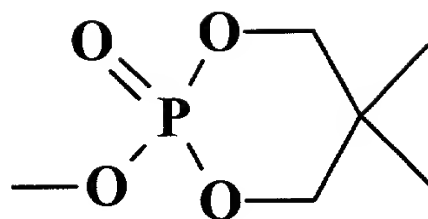
31. A method for reducing the production of carboxylic acid during use of a functional fluid comprising (a) a basestock comprising a phosphate ester, and  
10 (b) at least one acid scavenger, said method comprising admixing in said functional fluid at least one acid scavenger selected from epoxides of the formula:



epoxides of the formula:



- 15 mixtures thereof; wherein  $R^1$ ,  $R^2$  and  $R^3$  are independently selected from H,  $-(CH_2)_n-R$  and  $-C(O)-R^{12}$ , and wherein one or two of  $R^1$ ,  $R^2$  and  $R^3$  are  $-C(O)-R^{12}$  or  $-(CH_2)_n-R$ ;  $R^4$  is selected from H or  $-CH_3$ ; and  $R^5$ ,  $R^6$ ,  $R^7$  and  $R^8$  are independently selected from H,  $-(CH_2)_n-R$  and  $-C(O)-R^{12}$ , and wherein up to two of  $R^5$ ,  $R^6$ ,  $R^7$  and  $R^8$  are  $-C(O)-R^{12}$  or  $-(CH_2)_n-R$ ; wherein R is selected from H, a linear or branched alkyl group having 1 to  
20 12 carbon atoms, an arylalkyl group having 7 to 12 carbon atoms,  $-O-R^{10}$ ,  $-O-R^9-O-R^{10}$ ,



, or  $-\text{Si}(\text{OR}^{11})_3$ ;  $\text{R}^{12}$  is selected from a linear or branched alkyl group having 1 to 12 carbon atoms, or an arylalkyl group having 7 to 12 carbon atoms,  $n$  is an integer from 1 to 4,  $\text{R}^9$  is an alkylene group having 2 to 6 carbon atoms,  $\text{R}^{10}$  is an alkyl group having 1 to 12 carbon atoms,  $\text{R}^{11}$  is an alkyl group having 1 to 8 carbon atoms, and  $\text{R}^{12}$  is an alkyl group having 1 to 12 carbon atoms.

32. The method of claim 31 wherein said acid scavenger is an epoxide of formula (I).

33. The method of claim 32 wherein one of  $\text{R}^1$ ,  $\text{R}^2$  and  $\text{R}^3$  is  $-\text{C}(\text{O})-\text{R}^{12}$  or  $-(\text{CH}_2)_n-\text{R}$ .

34. The method of claim 33 wherein one of  $\text{R}^1$ ,  $\text{R}^2$  and  $\text{R}^3$  is  $-(\text{CH}_2)_n-\text{R}$ .

35. The method of claim 34 wherein  $\text{R}$  is selected from a linear or branched alkyl group having 1 to 12 carbon atoms, an arylalkyl group having 7 to 12 carbon atoms,  $-\text{O}-\text{R}^{10}$ ,  $-\text{O}-\text{R}^9-\text{O}-\text{R}^{10}$ .

36. The method of claim 35 wherein  $n$  is 1.

37. The method of claim 32 wherein  $\text{R}^1$  and  $\text{R}^2$  are  $-\text{C}(\text{O})-\text{R}^{12}$  or  $-(\text{CH}_2)_n-\text{R}$ .

38. The method of claim 37 wherein  $\text{R}^1$  and  $\text{R}^2$  is  $-(\text{CH}_2)_n-\text{R}$ .

39. The method of claim 38 wherein  $\text{R}$  is selected from a linear or branched alkyl group having 1 to 12 carbon atoms, an arylalkyl group having 7 to 12 carbon atoms,  $-\text{O}-\text{R}^{10}$ ,  $-\text{O}-\text{R}^9-\text{O}-\text{R}^{10}$ .

40. The method of claim 39 wherein  $n$  is 1.

41. The method of claim 32 wherein  $\text{R}^1$  and  $\text{R}^3$  are  $-\text{C}(\text{O})-\text{R}^{12}$  or  $-(\text{CH}_2)_n-\text{R}$ .

42. The method of claim 41 wherein  $\text{R}^1$  and  $\text{R}^3$  is  $-(\text{CH}_2)_n-\text{R}$ .

43. The method of claim 42 wherein  $n$  is 1.

44. The method of claim 32 wherein  $R^4$  is H.

45. The method of claim 31 wherein said acid scavenger is an epoxide of formula (II).

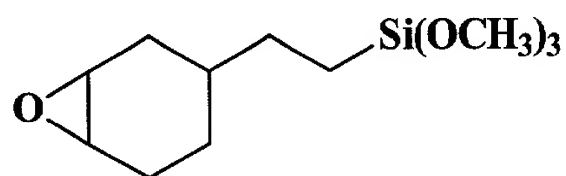
46. The method of claim 45 wherein one of  $R^5$ ,  $R^6$ ,  $R^7$  and  $R^8$  is  
5  $-C(O)-R^{12}$  or  $-(CH_2)_n-R$ .

47. The method of claim 46 wherein one of  $R^5$ ,  $R^6$ ,  $R^7$  and  $R^8$  is  $-(CH_2)_n-R$ .

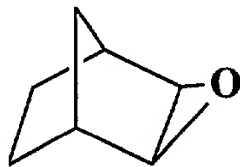
48. The method of claim 47 wherein n is 1.

49. The method of claim 31 wherein said acid scavenger is

10

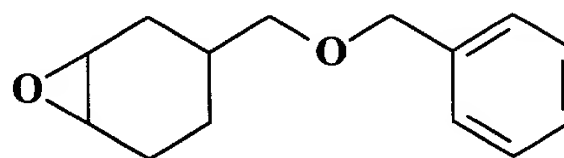


50. The method of claim 45 wherein said acid scavenger is:

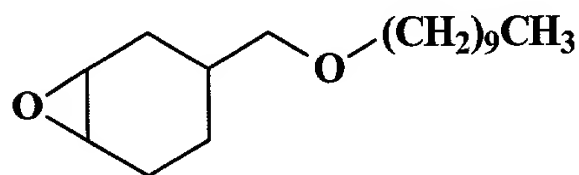


15

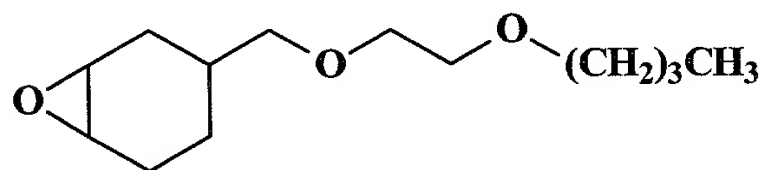
51. The method of claim 36 wherein said acid scavenger is



52. The method of claim 36 wherein said acid scavenger is:

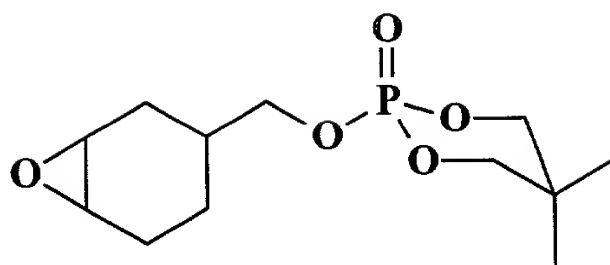


53. The method of claim 36 wherein said acid scavenger is:

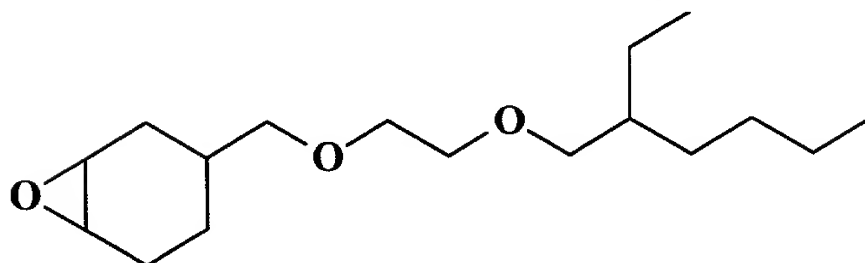


20

54. The method of claim 31 wherein said acid scavenger is:

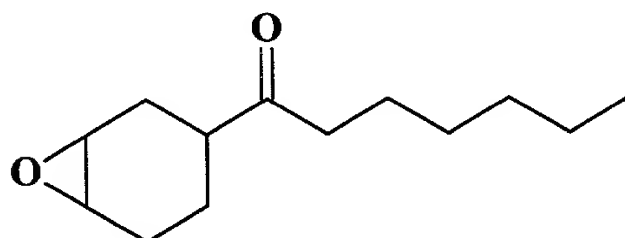


55. The method of claim 36 wherein said acid scavenger is:

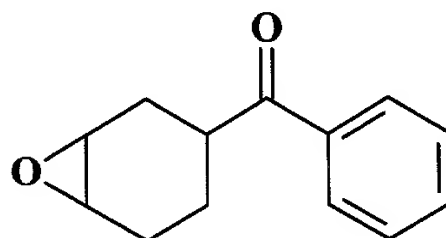


5

56. The method of claim 33 wherein said acid scavenger is:

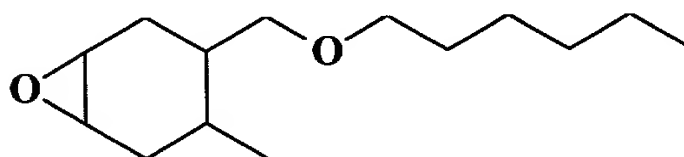


57. The method of claim 33 wherein said acid scavenger is

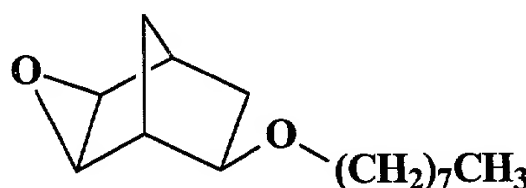


10

58. The method of claim 43 wherein said acid scavenger is:

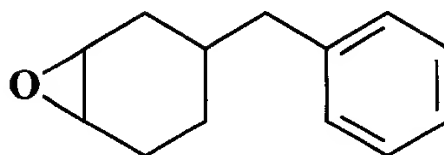


59. The method of claim 36 wherein said acid scavenger is:



15

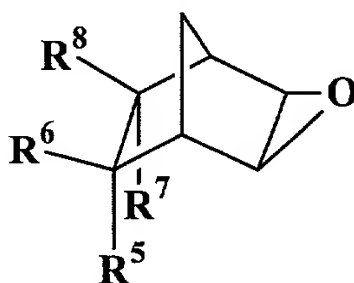
60. The method of claim 48 wherein said acid scavenger is:



61. An acid scavenger selected from the group consisting of

- 5 3-benzoxymethyl-7-oxabicyclo[4.1.0]heptane, 3-decyloxymethyl-7-oxabicyclo[4.1.0]heptane, 3-(2-n-butoxyethoxymethyl)-7-oxabicyclo[4.1.0]heptane, 3-(5,5-dimethyl-2-oxo-1,3,2-dioxaphosphorinanoxymethyl)-7-oxabicyclo[4.1.0]heptane, 3-(2-ethylhexoxymethyl)-7-oxabicyclo[4.1.0]heptane, 1-(7-oxabicyclo[4.1.0]hept-3-yl)-1-hexanone, 1-(7-oxabicyclo[4.1.0]hept-3-yl)-1-phenone,
- 10 4-methyl-3-hexoxymethyl-7-oxabicyclo[4.1.0]heptane, 3-(phenylmethyl)-7-oxabicyclo[4.1.0]heptane, and 6-n-octyloxymethyl-3-oxatricyclo[3.2.1.0<sup>2,4</sup>]octane.

62. An acid scavenger represented by the formula:



- wherein  $R^5$ ,  $R^6$ ,  $R^7$  and  $R^8$  are independently selected from H,  $-(CH_2)_n-R$  and
- 15  $-C(O)-R^{12}$ , and at least one of  $R^5$ ,  $R^6$ ,  $R^7$  and  $R^8$  is  $-(CH_2)_n-R$  or  $-C(O)-R^{12}$ ; wherein  $R^{12}$  is selected from a linear or branched alkyl group having 1 to 12 carbon atoms, or an arylalkyl group having 7 to 12 carbon atoms.